

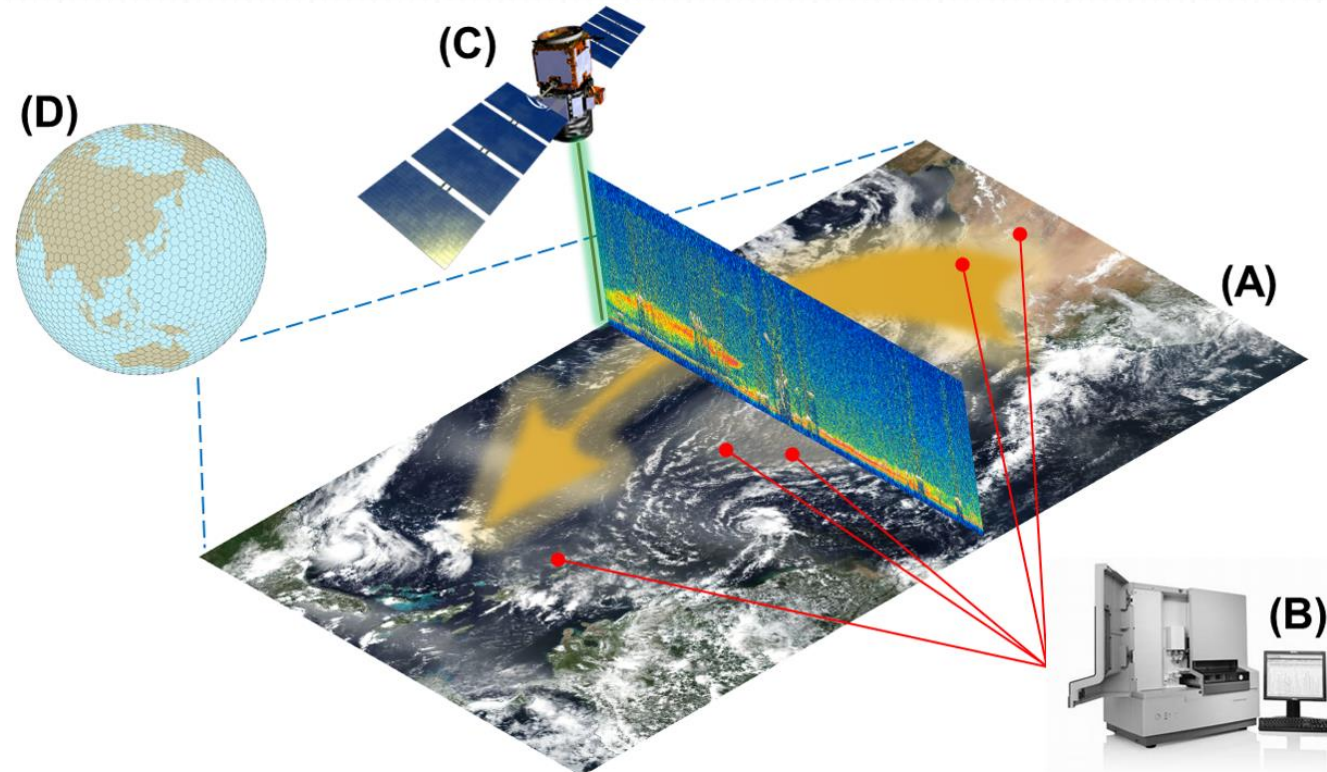
Multiscale Investigation of Microbial Biodiversity in Trans-Atlantic Dust Plumes

Hosein Foroutan, Virginia Tech

Project Overview

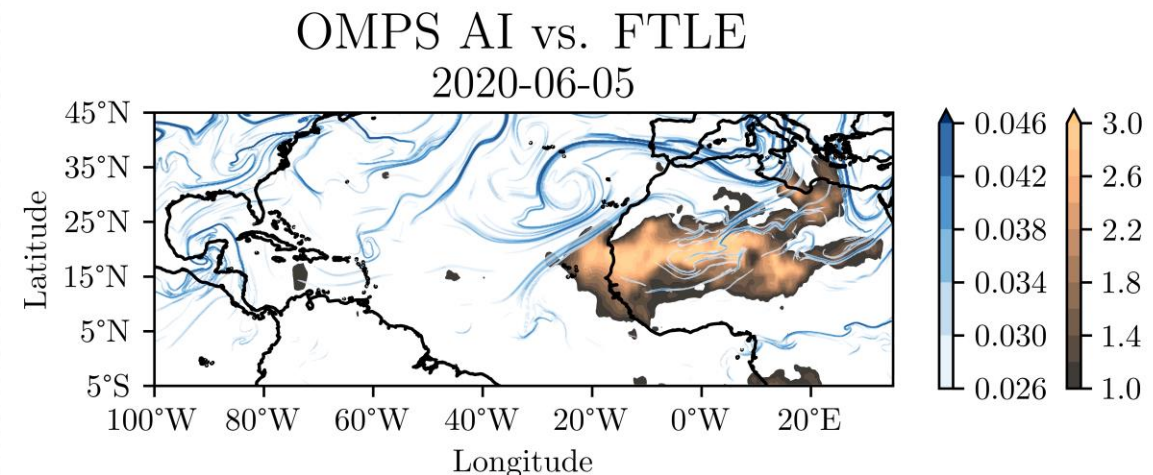
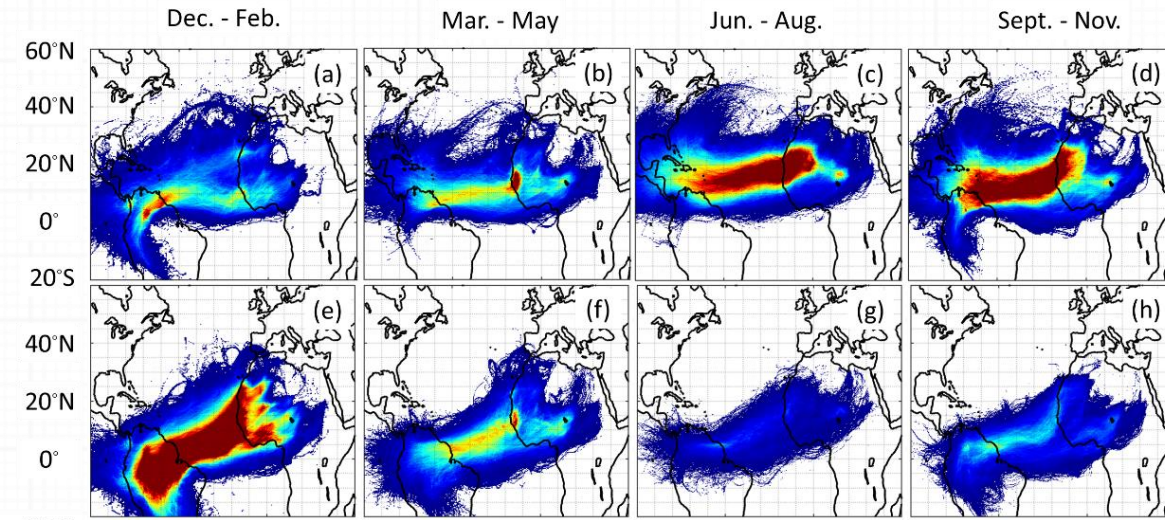
Overarching Goal: To improve our understanding of microbial long-range transport and survival in dust plumes.

Interdisciplinary Approach: Integrate **multiplatform satellite observations**, as well as **multiscale reanalysis and atmospheric simulation data** with **microbiological tools** to bridge dust aerosols transport and microbial biodiversity in the atmosphere.



Updates since October 2022

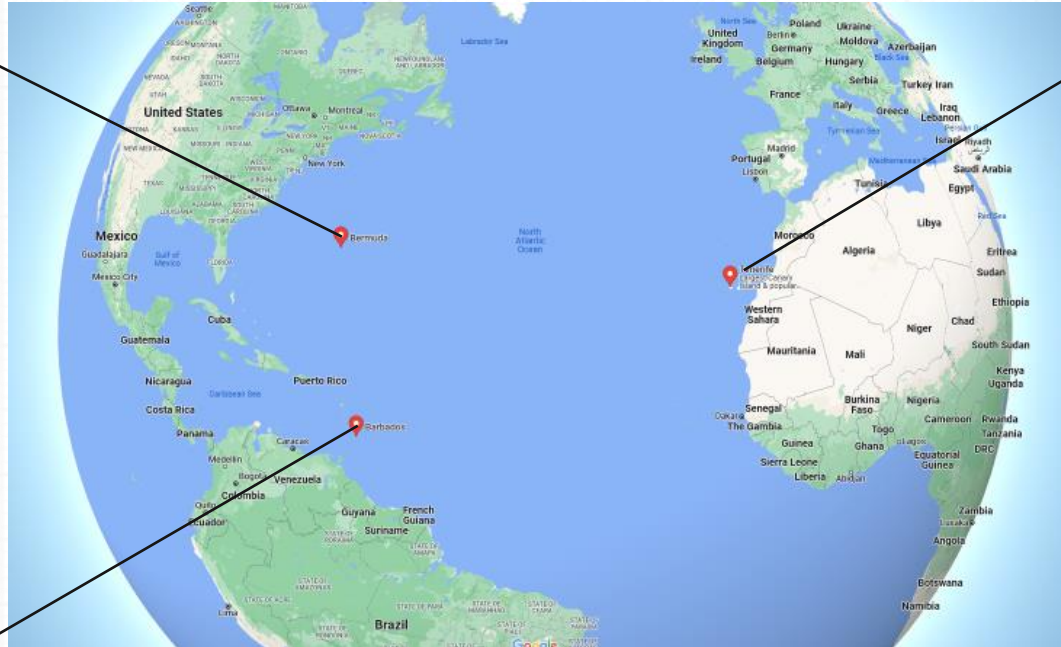
- One manuscript is published:
 - Pretorius et al., 2023. “In the Wind: Invasive Species Travel along Predictable Atmospheric Pathways.” *Ecological Applications* 33(3): e2806.
- Two manuscripts are submitted:
 - Mardi et al. “Long-Term Seasonal Trends in Sources and Pathways of Trans-Atlantic Dust Plumes and their Implications for Transport of Microorganisms”
 - Jarvis et al. “Atmospheric transport structures tied to the ‘Godzilla’ dust event”



Sampling Dust and Microbes: Coordinated Sampling



NASA ACTIVATE Campaign



University of La Laguna, Tenerife

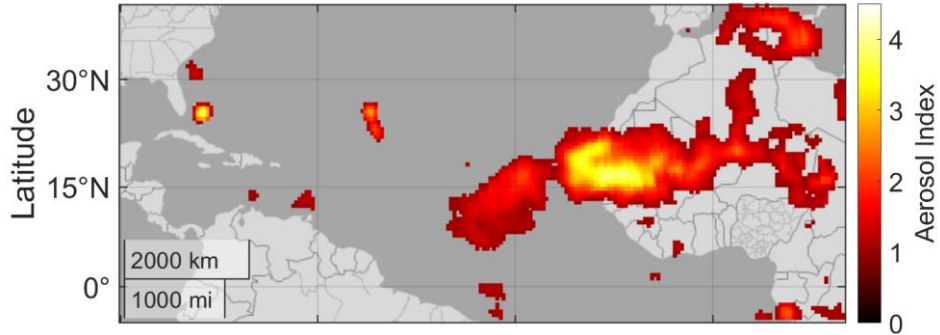


Barbados Atmospheric Chemistry
Observatory, Univ. of Miami

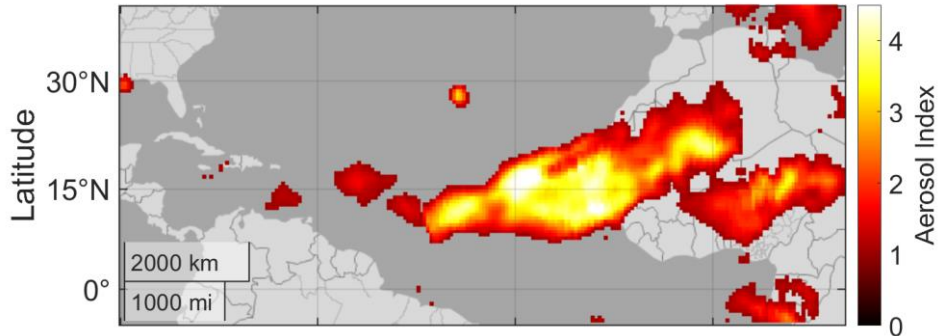


Sampling Dust and Microbes: June 2022 Dust Plume

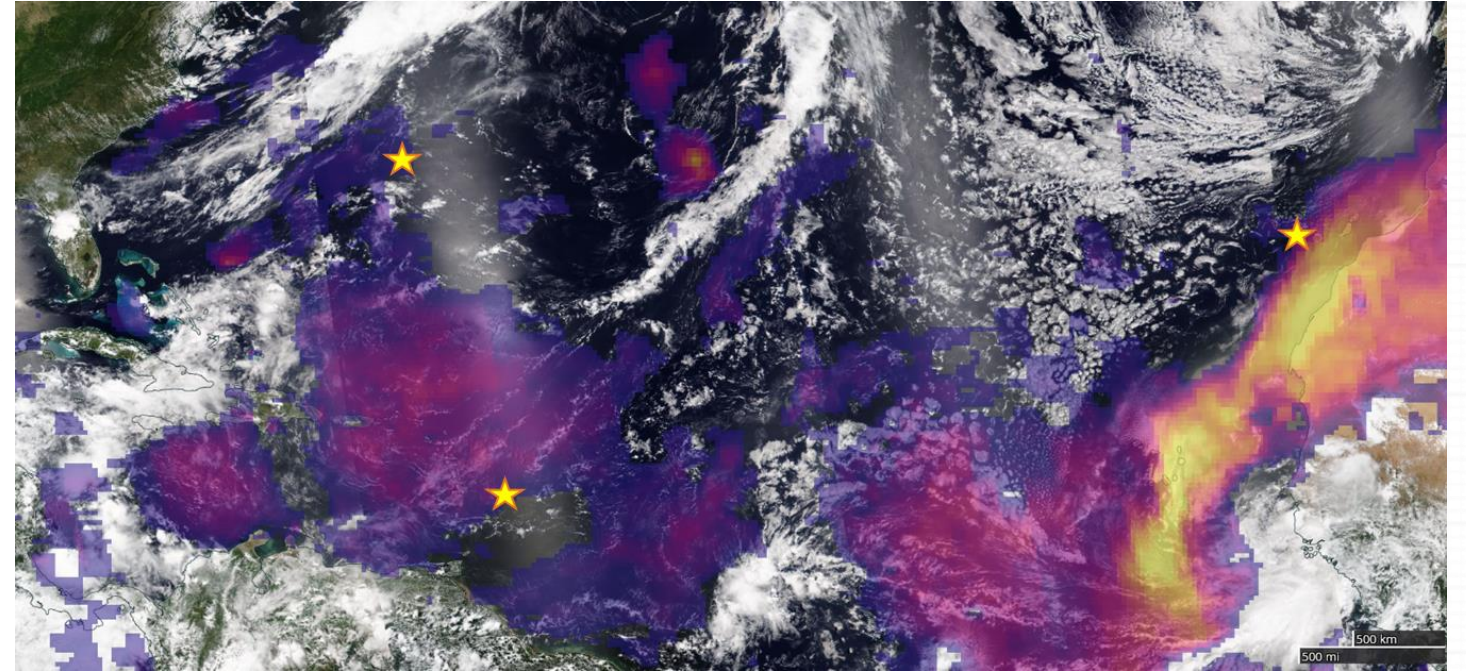
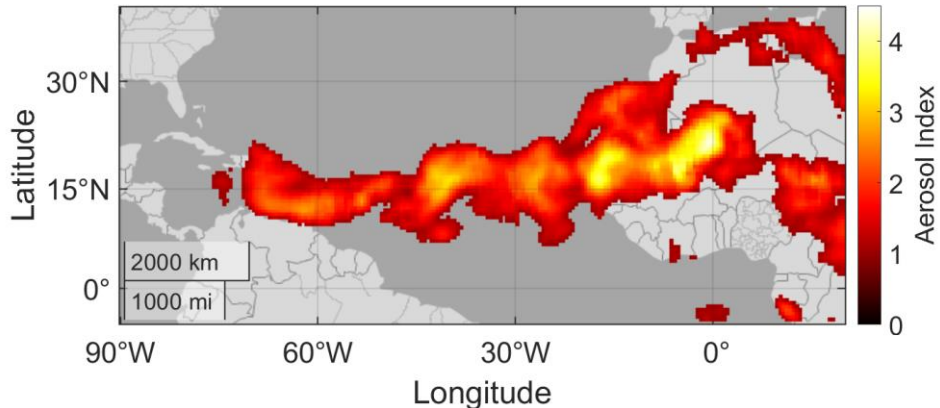
OMPS-AI 6-1-2022



OMPS-AI 6-4-2022



OMPS-AI 6-7-2022



Aerosol Index / Suomi NPP / OMPS

June 18, 2022

June 17-19

19-20

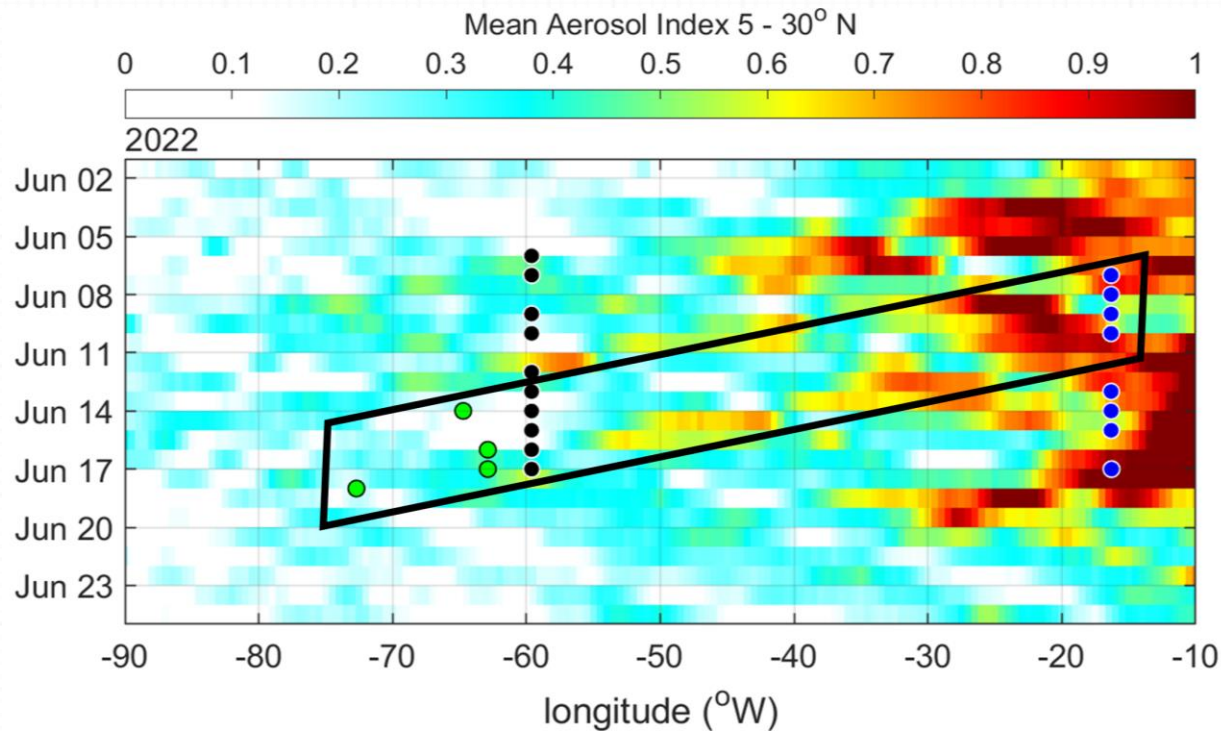
20-21

29-30 (low)

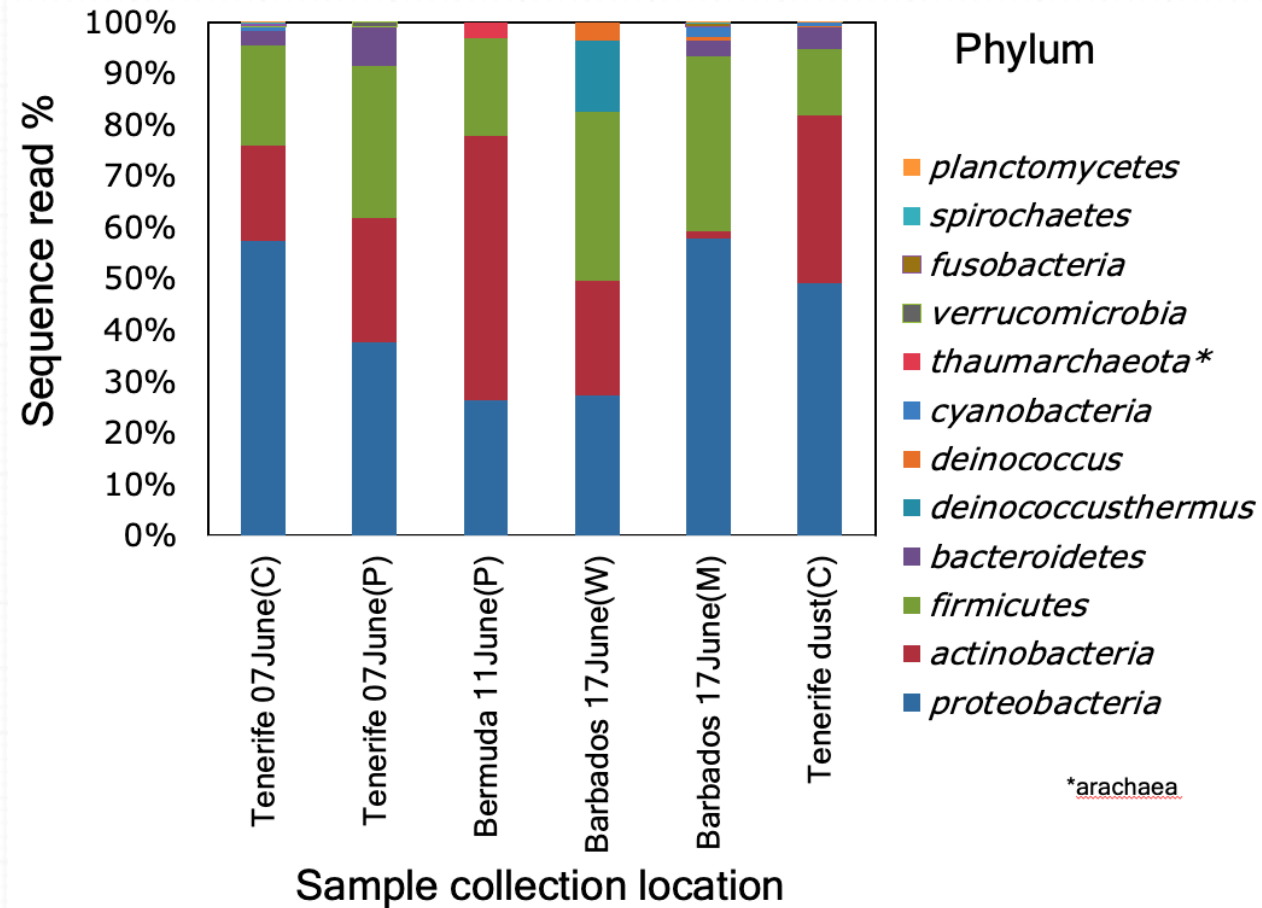


Filters collected in Barbados

Sampling Dust and Microbes: Ongoing Analysis



The Hovmöller diagram of dust plume evolution from June 1st – 25th. Circles indicate the collected air filter samples and are color coded by campaigns.



Graphical summaries of 16S taxa collected from different locations at the level of phylum.
(Caution: Preliminary results!)